

Meteor shower forecasting for spacecraft operations

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ABSTRACT

Although sporadic meteoroids are a much greater hazard to spacecraft than shower meteoroids in general, meteor showers can significantly increase the risk of damage over short time periods. Because showers are brief, it is sometimes possible to mitigate the risk operationally, which requires accurate predictions of shower activity. NASA's Meteoroid Environment Office generates an annual meteor shower forecast that describes the variations in the near-Earth meteoroid flux produced by meteor showers, which presents the shower flux both in absolute terms and relative to the sporadic flux. The shower forecast incorporates model predictions of annual variations in shower activity and quotes fluxes to several limiting particle kinetic energies. In this work, we describe our forecasting methods, compare them to actual observations, and highlight recent improvements to the temporal profiles based on flux measurements from the Canadian Meteor Orbit Radar (CMOR).